

# 5

# STEPS TO CONTROLLING PRRS

Porcine Reproductive and Respiratory Syndrome is a costly disease. Controlling PRRS requires a systematic whole-herd approach. We outline five simple and effective steps to protect your herd.

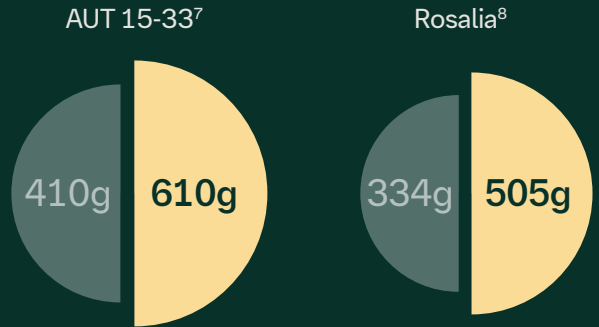
Some PRRS Modified Live Virus Vaccines are extraordinarily effective at providing protection, reducing the detrimental effect of the disease and making sure pigs reach their genetic potential.

% reduction in lung lesions in pigs challenged with PRRSV-1<sup>6</sup>

**50%**  
decrease

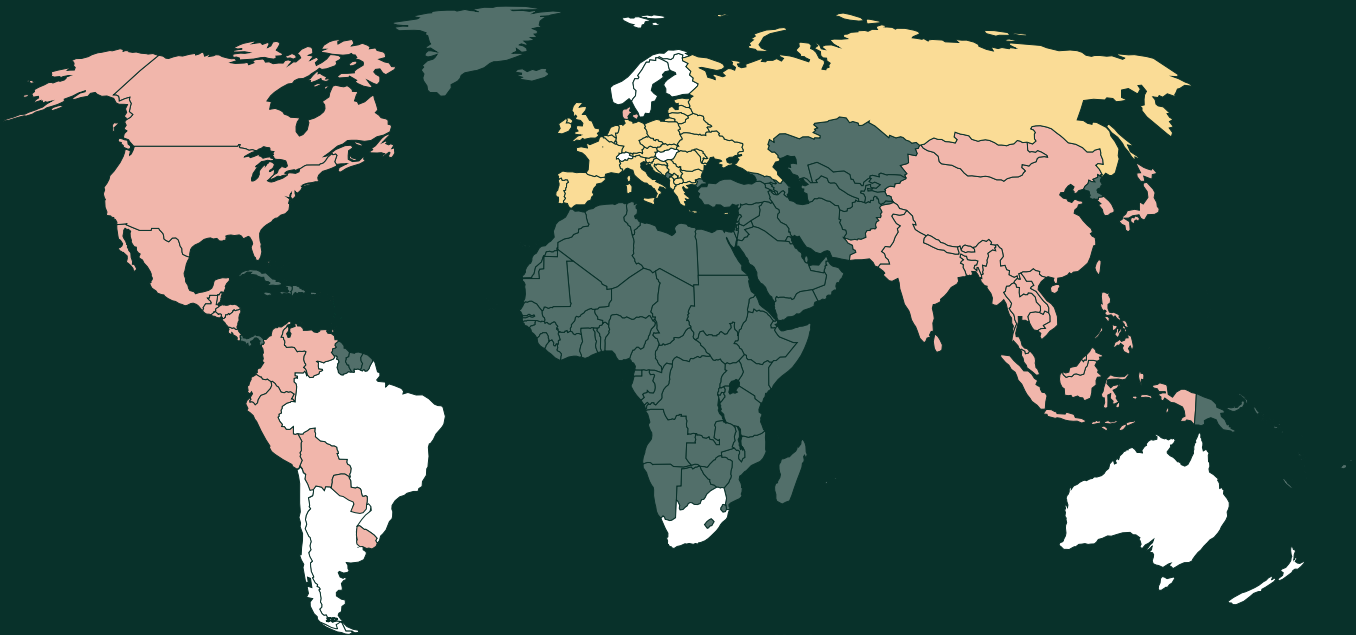
Average daily gain in pigs challenged with PRRSV-1

● Un-vaccinated  
● Vaccinated with Ingelvac PRRSFLEX<sup>®</sup> EU



The virus is a global problem. Different types of the virus are found all over Europe, Asia and the Americas and require a targeted approach.

● Mainly PRRSV-1 ● Mainly PRRSV-2 ● Free



New strains are emerging all the time, often highly dangerous ones, causing high mortality in unvaccinated pigs.

Belarus  
PRRSV-1  
Lena<sup>9</sup>



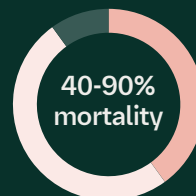
Austria  
PRRS-1 AUT  
15-33 strain<sup>11</sup>



Spain  
PRRSV-1 Rosalia  
strain<sup>13</sup>



China  
Collection of  
HP-PRRSV-2 strains<sup>10</sup>



US  
PRRSV-2 L1C.2  
& L1C.5<sup>12</sup>



## Economic impact of PRRSV in USA<sup>14</sup>



Most of that cost comes from growing pigs

**\$819m/year**  
growing pigs

Each outbreak can cost

**\$30**  
per growing pig

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**\$484**  
per sow

Pork producers can improve PRRS control by following five simple yet effective steps

These steps reduce infection pressure and maximize immunity, lowering PRRS-related costs.

## PRRS infection means higher costs



### PRODUCTIVITY

Higher mortality and fewer piglets born, with lower growth rates



### LABOR

Extra care for pigs raises labor costs and diverts from other important chores



### CARE

Higher vet bills and costly medicines and more feed to reach target weights



### ANTIBIOTICS

PRRS exacerbates the clinical signs from other infections that need drugs to treat

**01 Identify desired goals**  
Control the virus or completely eliminate it?

**02 Determine current PRRS status**  
Know how much of the virus is circulating and where this is happening

**03 Understand current constraints**  
Find the constraints that will stop you from reaching your goal

**04 Develop and implement solutions**  
Combine vaccination and biomanagement to best protect your herd

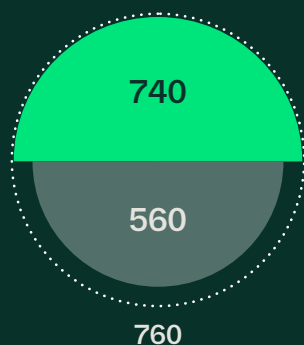
**05 Monitor outcomes**  
Track your progress and reassess if needed

## Vaccines help maintain pig growth

Even a small load of PRRS can have a big effect on growth for unvaccinated pigs.

Daily growth of **vaccinated** pigs is unaffected by a low to moderate challenge of PRRSV (g/day)<sup>15</sup>

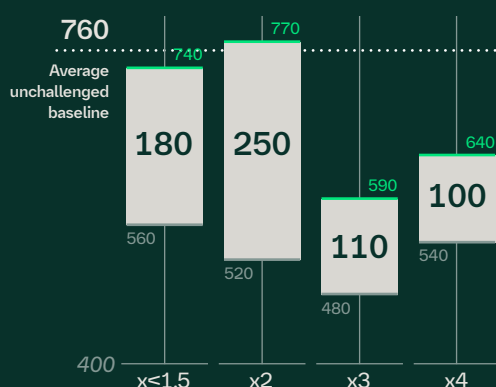
● Vaccinated ● Unvaccinated



Average unchallenged baseline

Vaccination can cancel this effect but this benefit decreases with increasing virus challenges.

The effect of increasing virus challenges on daily growth of **vaccinated** and unvaccinated pigs (g/day)<sup>15</sup>



Increasing PRRSV challenge dose (log<sub>10</sub> TCID<sub>50</sub>/mL)

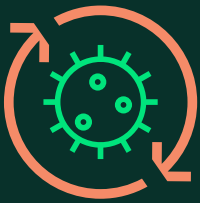


See references here

The 5-Step Process to controlling PRRS

# To control or eliminate PRRS?

There are five recommended steps to defining and maintaining a plan for managing PRRSV infection in a herd. Managing PRRS does not necessarily mean eliminating it. The first step is to identify the right goal for the farm. Which goal is right will depend on the environment and PRRS status of the farm.



## Unstable

Circulation of wild type virus in sows and piglets

Trend<sup>1</sup>

**Increasing** ↑

Less seasonality; herds stay unstable longer and produce positive piglets all year round.



## Stable

Weaned piglets are negative for wild type virus

Trend

**Unchanged** ↻

Farms aiming for stable status rely on vaccination rather than live virus inoculation.



## Transitioning

Working towards eliminating PRRSV entirely

Trend

**Decreasing** ↓

Fewer farms are aiming for elimination than 15 years ago. And because outbreaks now happen all year round, fewer farms are maintaining elimination.



## Negative

No presence of PRRSV or antibodies in the herd

Each status has a different level of risk and investment. Success depends on selecting a goal that is practical and achievable for your specific farm.

### Goal **Controlling PRRS**

There is no to minimal impact of PRRS while maintaining immune protection. But this requires a solid plan to successfully remove wild type virus in the breeding herd.

Makes sense for

Most commercial production systems with good biosecurity and vaccination compliance.



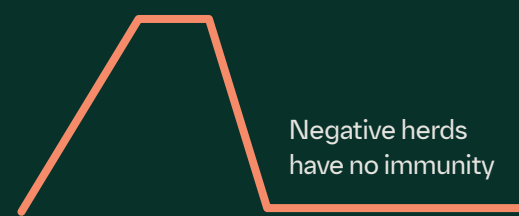
Herd immunity over time →

### Goal **Eliminating PRRS**

No need to vaccinate but also no herd immunity. Requires stringent whole herd biosecurity and for neighbouring farms to remain PRRS negative.

Makes sense for

Genetic companies; multipliers; selected commercial sow farms.

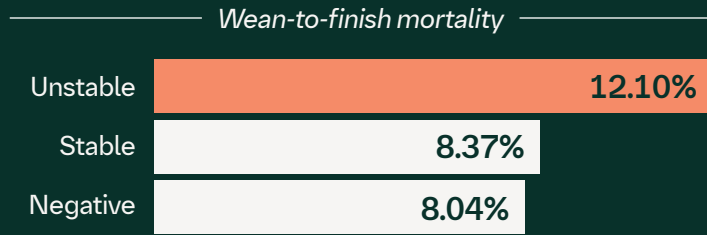


Herd immunity over time →

## Controlling PRRS: in depth

PRRS stable status means significant lower wean-to-finish mortality and comparable results to negative flows.<sup>2</sup>

In an outbreak, herds with ongoing vaccination had 40% less piglet loss than those without herd immunity.<sup>3</sup>



## Eliminating PRRS: in depth

Denmark has made strong progress on a national PRRS reduction programme. Infection risk has halved and the proportion of PRRS-negative herds has more than doubled since 2021.

This has required a painstaking process.

### Denmark

Surrounded by sea. PRRS negative nucleus and multiplier herds.



Assess the feasibility of the project

### Insights

Is your situation right for elimination? It requires remaining PRRS naïve for 2.5 years for the investment to break even.

Elimination is conducted at a national level including all farms.



Identify sites with pigs in the project area

Collaborate with neighbouring farms in a regional control program. Positive or unknown sites can carry a high risk of rebreaks.

Openly shared database for PRRS status of herds including pig movements.



Determine the PRRSV status of pig sites

Establish AASV PRRS Status classification for all sites, map it and share it openly.

Strict PRRS control plan including 12 weeks quarantine and vaccination. All herds must be stable before stopping vaccination.



Design site level PRRS control strategies

Apply the 5-Step Process and COMBAT for effective planning on regional level. Herd closure and nursery depopulation may be needed.

Ongoing monitoring of all systems tracks success of project with increasing numbers of negative farms.



Execute and monitor PRRS control strategies

Continuously monitor and share data on PRRS status. Reaching category 4 may take up to 2 years. New breaks must be prevented since there is no herd immunity.

Effective control or elimination is possible with the 5-Step Process



The 5-Step Process to controlling PRRS



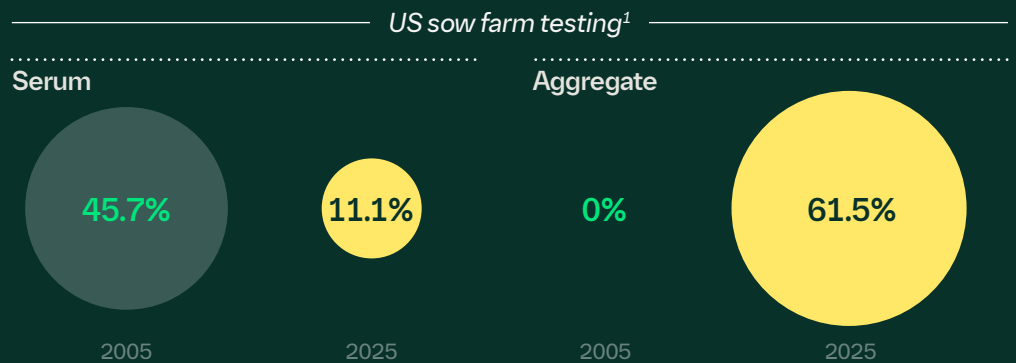
# Determine current PRRS status

Step One in the 5-Step Process is to identify the right goal for the farm.

Step Two is determining the current PRRS status of the herd so you can plan to reach your goal.

## Testing the herd

Modern producers are switching to aggregate testing. It captures herd-level data faster, for a fraction of the cost and effort.



## Finding the needle in the haystack with aggregate testing

PRRS virus can vary over space, with individual pigs in a herd being positive, and over time, reoccurring unpredictably. Aggregate testing catches infections that individual testing misses.<sup>2</sup>

### Sampling for testing

Comparing methods

In a barn with 100 pigs and a 3% PRRSV prevalence 3 pigs may be positive.<sup>2</sup>

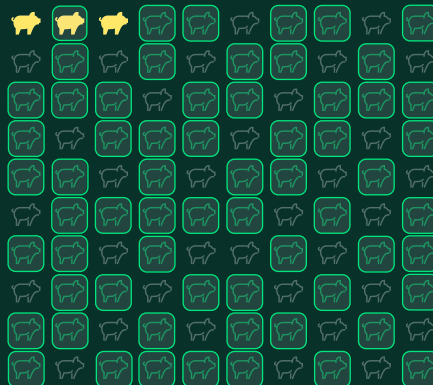


Sampled  PCR-positive

### Serum sampling

High labor & costs

64 pigs would need to be sampled to have a 95% chance of detecting PRRSV.



### Aggregate sampling

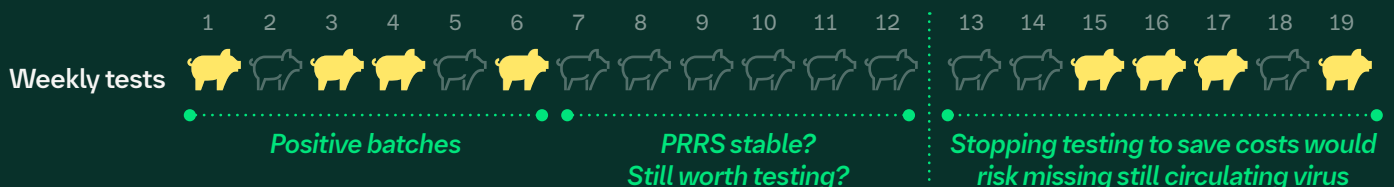
Low labor & costs

One pooled sample can detect if PRRSV is present anywhere in the population.



PRRS virus can reoccur after a period of negative tests. Cheaper aggregate testing makes it easier to constantly monitor.

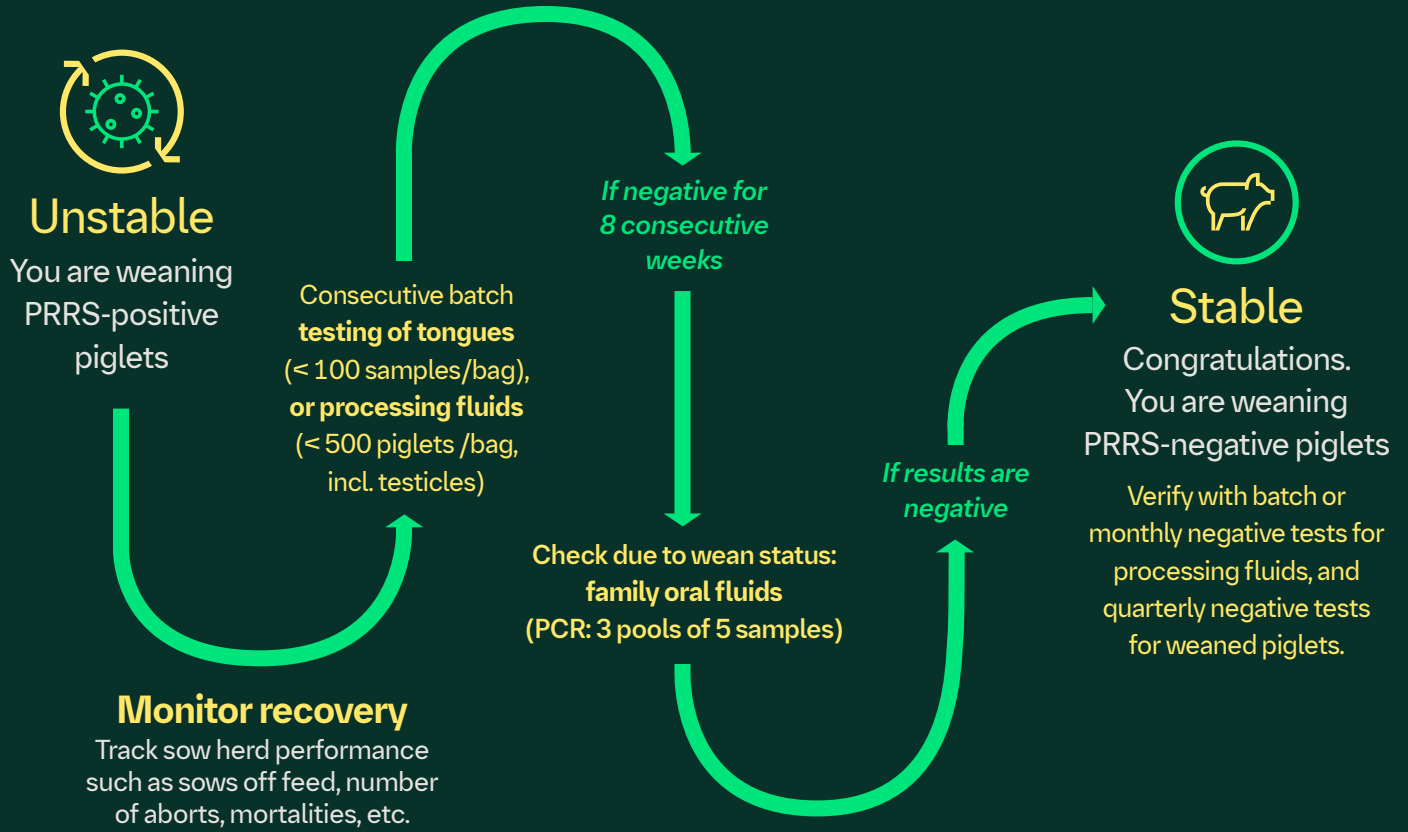
Example: PCR testing of processing fluids<sup>2</sup>



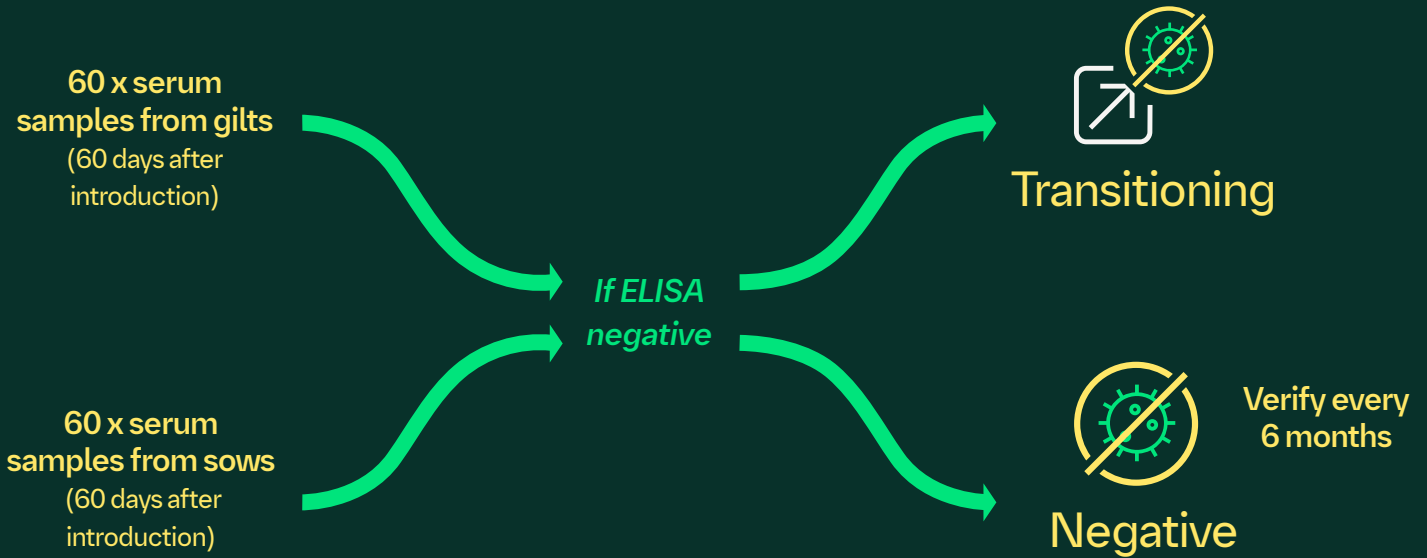
**Don't let a PRRS-free streak be a costly mistake. Continuous aggregate testing makes sure you're on track.**

# Running aggregate tests to determine the status of the sow herd

## Unstable and stable herd



## Naive herd



If the PCR results are **positive**, genotyping can answer further questions:

- The number of strains present
- The origin of the PRRS strain
- Is this a new introduction or a re-break?

### Grow / Finish

Oral fluids testing at beginning and end of each phase  
Place 6 ropes (1PCR/3 ropes)



The 5-Step Process to controlling PRRS

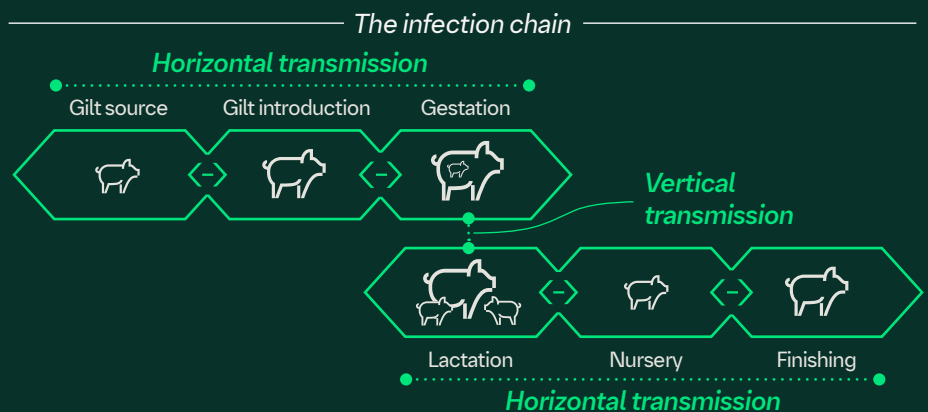
# Understand current constraints

Once you have determined the status of the farm in Step 2 you need to understand what might stop you moving that farm to the goal set in Step 1.

## Controlling transmission

Whatever the goal, the overall aim is to break the infection chains and curb the transmission of PRRS. This transmission can happen in two ways:

- **Vertically:** from sows to piglets
- **Horizontally:** between sows & piglets



## The constraints

Five key factors can limit our ability to control the transmission of PRRSV.



### Biosecurity

How PRRS might enter & circulate in a farm



### Labor

Lack of staff and training correlates with PRRS breaks



### Pig flow

How infected pigs might mix with others



### Co-infections

The combined effects of multiple infections



### Vaccination

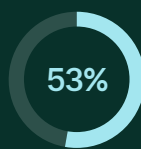
How misuse reduces effectiveness



## Biosecurity<sup>1</sup>

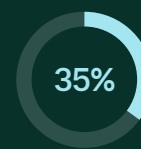
Biosecurity breaks infection chains. Using a digital tool like COMBAT is vital in assessing and improving biosecurity.

### Example biosecurity issues



#### Transport<sup>9</sup>

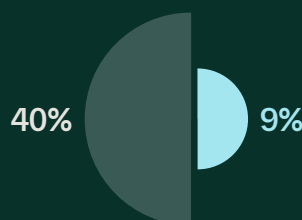
Any given truck has a 53% chance of being infected with PRRS by the end of the day and the virus can survive for 6 days at room temperature.



#### Labor<sup>10</sup>

An employee turnover of over 35% a year increases PRRS risk sharply.

Good biosecurity can reduce the risk of a PRRS outbreak from 40% to 9%



### Barriers to implementing biosecurity

- Cost of implementation
- Difficulty in pig dense areas
- Knowledge gaps and education

### Drivers to implementing biosecurity

- Economic benefit of fewer breaks
- Tools and clear guidance
- Collaboration with vets



## Pig flow

Mixing appears to have a significant long-term effect on the growth of pigs.

Not mixing pigs can result in a higher average daily weight gain.

# +74g/day

analyzed from 11 - 21 weeks of age<sup>2</sup>

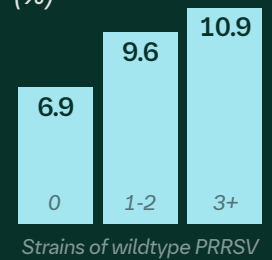
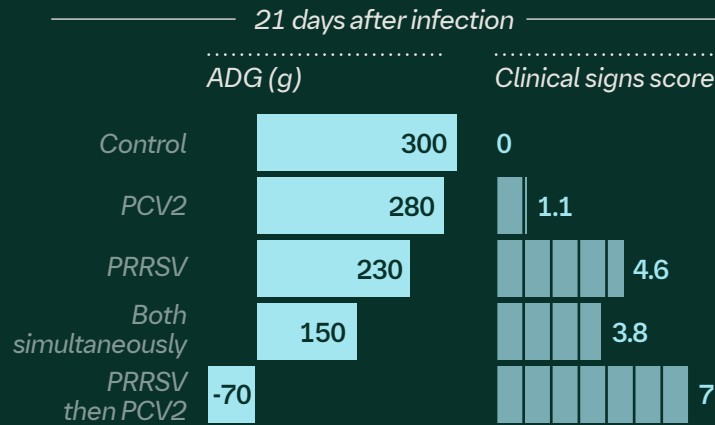


## Co-infection

PRRSV acts like a 'door opener', inhibiting the pig's immune system and leaving the herd vulnerable to secondary pathogens.

Simultaneous infections can have a much **greater impact** on the infected pigs.<sup>3</sup>

This is also true for infection with multiple PRRS strains. 90% of farms break with more than one strain at the same time.<sup>4</sup> Wean-finish mortality (%)



## Vaccination

Vaccines are very effective in helping to control PRRS but need to be handled and administered properly.

### Potential risks<sup>5</sup>



#### Temperature

Modified live vaccines must be stored between 2-7°C



#### Timing

Vaccinate 3-4 weeks prior to exposure



#### Conditions

Pigs must be unstressed and healthy



#### Dosing

Under-dosing severely reduces vaccine efficacy



#### Purity

Misuse can inactivate vaccines



### Only 1 in 10 farms

have a thermometer to check fridge temperatures.<sup>6</sup>

# 61%

### increase in mortality in half-dose groups

during grow finish compared to full-dose groups.<sup>8</sup>

# 100%

### inactivation

of a PRRS MLV vaccine after mixing with a non-DiaTEC-purified vaccine.<sup>5</sup>

Effective PRRS control depends on identifying what disrupts it. With these constraints identified, we move to Step 4 to implement tailored solutions. Use of COMBAT can help you assess and improve biosecurity to avoid future outbreaks.



The 5-Step Process to controlling PRRS

# Make a plan

Once you have determined what might stop you from achieving your goal for your farm (Step 3), you need to make a plan to overcome those constraints.

## The solutions

Five key interventions can enhance our ability to control the transmission of PRRSV.



### Biosecurity

Assess and improve biosecurity



### Labor

Retain qualified staff and train in biosecurity



### Pig flow

Reduce the mixing of piglets



### Co-infections

Vaccinate to control multiple infections



### Vaccination

Ensure whole-herd vaccination



## Biosecurity<sup>1</sup>

Every production system is different—every farm has its own challenges and solutions. Digital tools like COMBAT assess farm's **specific** needs and recommend **actionable** interventions to improve biosecurity. Additionally they help to predict outbreaks.

### Assessment

COMBAT can help to assess biosecurity in just 15 minutes.

#### Common biosecurity issues<sup>2</sup>

#### External



pig transport



fodder supply



equipment supply

#### Internal



Compartmentalisation



working lines



staff training

### Implementation

Accurate assessment allows targeted and specific action to improve biosecurity.

#### Example interventions

#### Transport<sup>3</sup>

washing and disinfecting trucks reduces the risk of infection by 66%

↓ 66%

#### Labor<sup>4</sup>

downtime for staff working multiple sites reduces the risk of outbreak by 85%

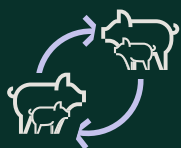
↓ 85%



## Pig flow

Contact between pigs is a major contributor to the spread of disease

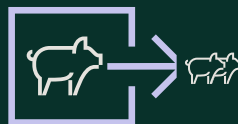
#### Top recommendations



**Cross-fostering:** move pigs only when necessary (within first 48h)



Do not move sick piglets



Wean all piglets from the same farrowing group at the same time



Do not allow any weaned piglets to remain in farrowing rooms



Strict batch production (all in/all out)



## Co-infection<sup>1</sup>

PRRS weakens the immune system. Controlling it ensures that other necessary vaccinations, such as PCV2 and Mhp, work more effectively. Also, a whole herd approach to prevent endemic infections like PCV2, Mhp and Lawsonia improves PRRS control.



## Vaccination

Without control PRRSV would remain in herds indefinitely. PRRS vaccination of all pigs, especially grow-finish, is key to maintaining stable status.

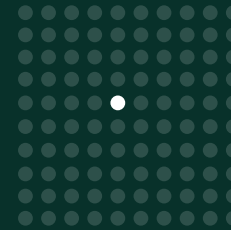
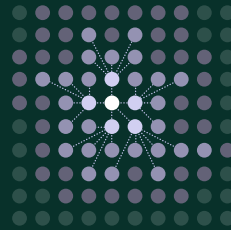
### Why vaccinate grow-finish pigs?

Most new strains of PRRS emerge among grow-finish pigs, creating serious economic impact and the engine of infection on the farm.

Since 5-10% of the herd are sows, this puts them at risk too.

Protecting grow-finish pigs also protects the sows.

In susceptible grow-finish herds each infected passes the virus to 5.4 other pigs.

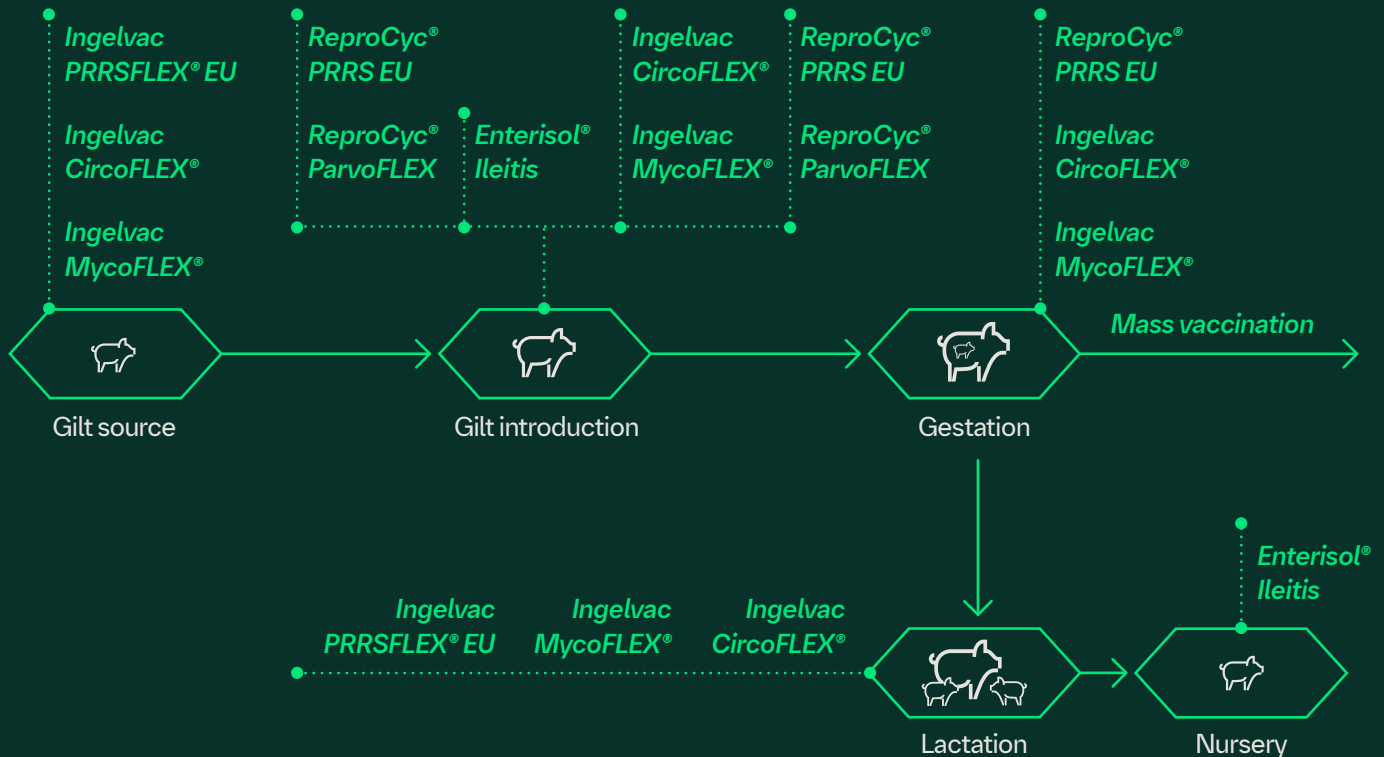


In fully immunised herds, the spread is limited to 0.3 pigs, limiting infection.



Scan to see how vaccination stops the spread

## How to vaccinate



The 5-Step Process to controlling PRRS

# Monitor outcomes

Once you have developed a solution for controlling PRRS (Step 4) and reaching your goal, you need to keep monitoring your progress to make sure everything is going according to plan.

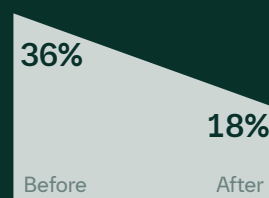
Following all 5 Steps is vital to reaching your desired goal.



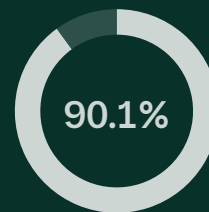
## Stable status

Weaned piglets are negative for wild type virus

In a study of 11 neighboring farms, implementing the 5-Step Process produced significant positive results.



Number of farms with PRRS related outbreaks dropped from 36% to 18%

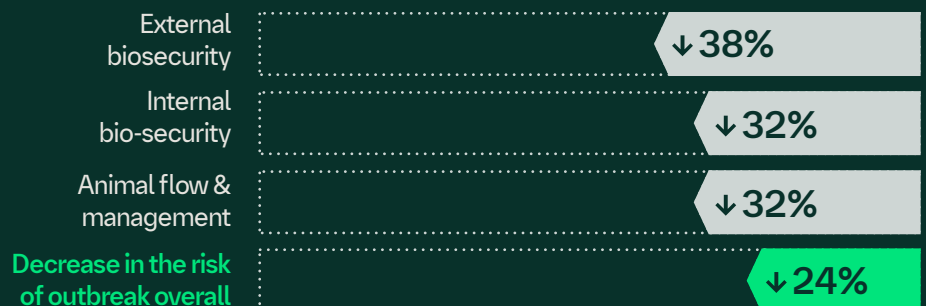


90% of the farms involved saw an increase in litter sizes

# ROI of 12:1

90% of the farms involved saw a positive return on investment (ROI)

They saw risk reductions in



## Negative status

No presence of PRRSV or antibodies in the herd

By successfully implementing the 5 Steps, PRRS was eliminated from 12 Danish swine herds in just 6 months.

Four years since the project began all the herds remain PRRSV-negative.

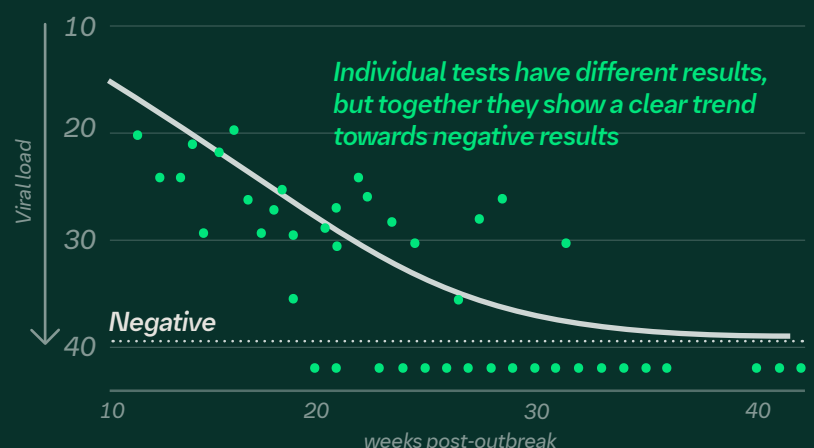
## Monitoring

The success of the 5 Steps is dependent on consistent and constant monitoring.

By testing regularly you can easily spot trends in the results and know whether you are improving.

Regular testing can reveal issues with your progress.

How to tackle them is part of the flow chart on the next page.



# Getting from an outbreak to stable status takes time and needs monitoring

## Milestones

Recovery from an outbreak usually follows this timeline

## Monitoring

Regular screening with processing fluids will trace progress, but adding other tests can help keep you on track

